NPL SEARCH (FAOM) 04/22/2003 Prepared in Support of Paper No. 8

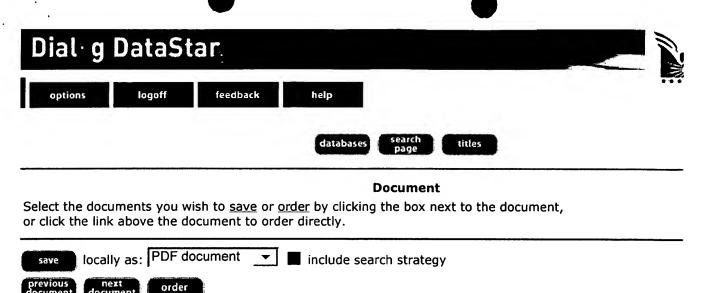
09/849,380
INSPEC (INZZ) DATABASE

SEARCH HISTORY/RESULTS ATTACHED

09/849380

Search history:

No.	Database	Search term	Info added since	Results	
1	INZZ	(electrophoresis OR fluorescen\$2 OR phosphorescen\$2 OR fluorescen\$2 OR bioluminescen\$2 OR luminesen\$2) AND (beam\$1 OR light OR illuminat\$3 OR energy OR radiation) NEAR guid\$3	1980	121	show titles
2	INZZ	(refract\$4 OR index) NEAR (first OR second OR third) AND (electrophoresis OR fluorescen\$2 OR phosphorescen\$2 OR fluorescen\$2 OR bioluminescen\$2 OR luminesen\$2) AND (beam\$1 OR light OR illuminat\$3 OR energy OR radiation) NEAR guid\$3	1980	0	-
3	INZZ	refract\$4 NEAR index AND (electrophoresis OR fluorescen\$2 OR phosphorescen\$2 OR fluorescen\$2 OR bioluminescen\$2 OR luminesen\$2) AND (beam\$1 OR light OR illuminat\$3 OR energy OR radiation) NEAR guid\$3	1980	6	show titles
4	INZZ	capillary AND (beam\$1 OR light OR illuminat\$3 OR energy OR radiation) NEAR guid\$3	1980	50	show titles



# document 31 of 50 Order Document

INSPEC - 1969 to date (INZZ)

# Accession number & update

5185015, A9606-4281P-003, B9603-7230E-053; 960216.

#### **Title**

Optical sensor instrumentation using absorption- and fluorescence-based **capillary** waveguide optrodes.

# Author(s)

Weigl-B-H; Draxler-S; Kieslinger-D; Lehmann-H; Trettnak-W; Wolfbeis-O-S; Lippitsch-M-E.

#### **Author affiliation**

Center for Bioeng, Washington Univ, Seattle, WA, USA.

# Source

Chemical, Biochemical, and Environmental Fiber Sensors VII, Munich, Germany, 19-20 June 1995. Sponsors: SPIE, Comm. Eur. Communities, Air & Waste Manage. Assoc., Deutsche Forchungsanstalt für Luft-und Raumfahrt eV, et al.

In: Proceedings-of-the-SPIE-The-International-Society-for-Optical-Engineering (USA), vol.2508, p.199-209, 1995.

#### **CODEN**

PSISDG.

#### **ISSN**

ISSN: 0277-786X, CCCC: 0 8194 1866 8/95/ (\$6.00).

#### **Availability**

SICI: 0277-786X(1995)2508L.199:OSIU; 1-M.

# **Publication year**

1995.

## Language

EN.

## **Publication type**

CPP Conference Paper, J Journal Paper.

# **Treatment codes**

P Practical; X Experimental.

#### Abstract

An analytical instrument comprising absorption- and fluorescence-based **capillary** waveguide optrodes (CWOs) is described. Glass capillaries with a chemically sensitive coating on the inner surface are used for optical chemical sensing in gaseous and liquid samples. In case of absorption-based CWOs, **light** from an LED is coupled into and out of the **capillary** under a defined angle via a rigid waveguide and an immersion coupler. The coated glass **capillary** forms an inhomogeneous waveguide, in which **light** is **guided** in both the glass and the coating. The portion of the **light** which is absorbed in the

chemically sensitive coating is proportional to chemical concentration or activity. This principle is demonstrated with a pCO/sub 2/-sensitive inner coating. Typical relative **light** intensity signal changes with this type of optical interrogation are 98%, with an active **capillary** length of 10 mm. For fluorescence-based CWOs, the excitation **light** from an LED is coupled diffusely into the glass **capillary** and the optical sensor layer. A major portion of the excited fluorescence **light** is then collected within the coated **capillary**, and **guided** to the photodiode, which is located on the distal end of the **capillary** waveguide. Hereby, the excitation **light** is separated very efficiently from the fluorescent **light**. As an example, a CWO for pO/sub 2/ is described. Using this optical geometry, it is possible to use the fluorescence decay time of the sensor layer as the transducer signal, even when using solid state components (LEDs and photodiodes). (25 refs).

#### **Descriptors**

<u>chemical-sensors</u>; <u>fibre-optic-sensors</u>; <u>fluorescence</u>; <u>gas-sensors</u>; <u>light-absorption</u>; <u>light-emitting-diodes</u>; <u>optical-fibre-cladding</u>; <u>optical-fibre-couplers</u>; <u>optical-glass</u>; <u>photodiodes</u>.

# Keywords

optical sensor instrumentation; absorption based **capillary** waveguide optrodes; fluorescence based **capillary** waveguide optrodes; analytical instrument; chemical concentration; chemically sensitive coating; optical chemical sensing; gaseous samples; liquid samples; absorption based CWOs; LED **light** coupling; rigid waveguide; immersion coupler; coated glass **capillary** inhomogeneous waveguide; CO2 sensitive inner coating; relative **light** intensity signal change; active **capillary** length; diffusely coupled LED excitation; photodiode; fluorescent **light**; O2 sensitive inner coating; fluorescence decay time; 10 mm; CO2; O2.

# **Classification codes**

A4281P	(Fibre optic sensors; fibre gyros)
A8280T	(Chemical sensors).
B7230E	(Fibre optic sensors).
B7320T	(Chemical variables measurement).
B7230L	(Gas sensors).

# Chemical indexing

CO2 bin, O2 bin, C bin, O bin; O2 el, O el.

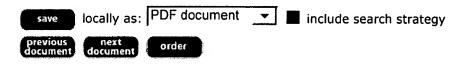
# **Numerical indexing**

size: 1.0E-02 m.

#### Copyright statement

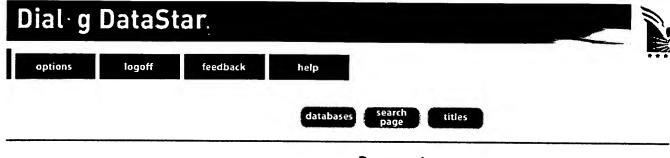
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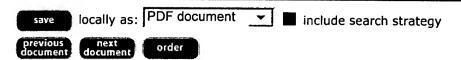
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# document 47 of 50 Order Document

INSPEC - 1969 to date (INZZ)

# **Accession number & update**

1344379, A79037017, B79022648; 790000.

Title

Effect of multimode capillary light guides on light polarization.

# Author(s)

Bykov-A-M; Volyar-A-V; Kuchikyan-L-M.

**Source** 

Ukrayins-kyi-Fizychnyi-Zhurnal (Ukrainian SSR), vol.24, no.1, p.132-4, Jan. 1979.

CODEN

UFIZAW.

ISSN

ISSN: 0503-1265.

**Publication year** 

1979.

#### Language

RŠ.

# **Publication type**

J Journal Paper.

#### **Treatment codes**

X Experimental.

## **Abstract**

It is shown that a double-layer **light guide** with a liquid core is capable, in certain conditions, of transmitting polarized **radiation** with a polarization not less than 0.98, whilst analogous double-layer glass **guides** depolarize **light**. The dependence of the degree of polarization on the conditions of excitation centring and the angle between the axes of the microobjective and the **light guide**, with excitation by a parallel **beam** of coherent **light**, when oblique **radiation** predominates, was investigated. It was found that bending the **light guide** to a radius of 10 cm does not significantly affect the character of the polarization of the **light** transmitted. (5 refs).

## **Descriptors**

light-polarisation; optical-waveguides.

#### Kevwords

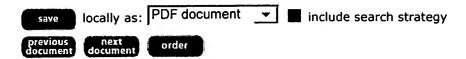
multimode capillary light guides; light polarization; liquid core.

#### Classification codes

A4280L (Optical waveguides and couplers).

B4130 (Optical waveguides).

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EAST SEARCH (FAOM) 04/21/2003 Prepared in Support of Paper No. 8

09/849,380

**EAST 1.3.1** 

- SEARCH HISTORY (I) ATTACHED
- SEARCH RESULTS (II) ATTACHED
  - (1) FRO+KWIC REVIEWED BY EXAMINER
  - (2) ALL SECTIONS REVIEWED BY EXAMINER
  - (C) CITED ON PTO-892 BY EXAMINER
  - (3) CITED ON PTO-1449 BY APPLICANT

<u> </u>	1 2 C 3	Document ID ▽	Title	Current OR
1	XXIII us	6542691 B2	Glass capillary array for fluorescence analysis and manufacturing method thereof	385/146
2	US US	6519099 B1	Lens system and optoelectric alignment apparatus	359/819
3	<b>⊠</b> Us	6475363 B1	Apparatus and method for performing microfluidic manipulations for chemical analysis and synthesis	204/451
4	XIII us	6235175 B1	Microfluidic devices incorporating improved channel geometries	204/453
5	VS (	6213151 B1	Microfluidic circuit designs for performing fluidic manipulations that reduce the number of pumping sources and fluid reservoirs	137/827
6	XXIII us (	6144791 A	Beam steering for optical fibers and other related devices	385/123
7	US 6	6017434 A	Apparatus and method for the generation, separation, detection, and recognition of biopolymer fragments	204/612
8	US 5	5938908 A	Capillary array electrophoresis system	204/603
9	US 5	5882369 A	Method for producing a capillary inside a moldable material	65/64
10	US 5	5880071 A	Electropipettor and compensation means for electrophoretic bias	204/453
11	US 5	833826 A	Method and apparatus for reducing the distortion of a sample zone eluting from a capillary electrophoresis capillary	204/452
12	US 5	796892 A	Delivery of radiation from a first transparent medium to a second transparent medium having a lower refraction index	385/38
13	US 5	757014 A (	Optical detection device for analytical measurement of chemical substances	250/458.1
14	US 5.	582705 A I	Multiplexed capillary electrophoresis system	204/603
15	US 5	529679 A I	DNA detector and DNA detection method	204/603
16	US 54	439578 A N	Multiple capillary biochemical analyzer	204/603
17	US 51	141609 A S	Method and device employing time-delayed integration for detecting sample components after eparation	204/452
18	X US 50	073239 A F	Tuid introduction into a capillary by electroendosmosis	204/453
19	US 50	001737 A F	ocusing and guiding X-rays with tapered capillaries	378/147
20	US 49	960316 A C	apillary splice	385/95
21	XX US 41	159863 A C	Coupling of optical glass fibres	385/33
22	US 20	0030068134 A1 T	uning the index of a waveguide structure	385/50
23	US 20	0030067599 Aı D	etection cell	356/246
24	US 20	0020162746 A1 E	nergy beam guide for an electrophoresis system	204/452
25	US 20	<u></u>		385/146
26	EP 67	9881 A C	ptical detector for liquid chromatography, capillary electrophoresis - uses analyte and reference fluid hannels which are etched into cover and substrate with light path constructed as Bragg waveguide ktending through analyte fluid channel	

	1 2 C 3 Document ID ∇	Title	Current OR
27	EP 1106988 A2	Flow cell with an inner layer of an amorphous fluoropolymer having a refractive index less than the refractive index of water	
28	DE 19616824 A	Micro-column analytic system with optical fibre for sample of fluid for liquid chromatography - has non-rigid coupling of detector-terminated fibre to outlet from capillary where light of selected wavelength interacts with flowing sample	••••••••••••••••••••••••

# ADDITIONAL RUENIES ( TEXULTS INCLUSED ON III)

	Hits	Search Text	DBs	L#
1	538	(385/124).CCLS.	USPAT; US-PGPUB	Lı
2	247	(385/146).CCLS.	USPAT; US-PGPUB	L2
3	1	ı and electrophoresis	USPAT; US-PGPUB	Lз
4	2	2 and electrophoresis	USPAT; US-PGPUB	L4
5	20	1 and (first near2 (refract\$3 index material)) same (second near2 (refract\$3 index material)) same (third near2 (refract\$3 index material))	USPAT; US-PGPUB	L5
6		2 and (first near2 (refract\$3 index material)) same (second near2 (refract\$3 index material)) same (third near2 (refract\$3 index material))	USPAT; US-PGPUB	L6
7		2 and capillary	USPAT; US-PGPUB	L7
8	22	ı and capillary	USPAT; US-PGPUB	L8
9	5	("3492058"   "3910677"   "3932184"   "4049413"   "4067937").PN.	USPAT	L33
10		4159863.URPN.	USPAT	L36

	1	2	:[0	3	Document ID ▽	Title	Current OF
1		X	Ĺ		US 6542691 B2	Glass capillary array for fluorescence analysis and manufacturing method thereof	385/146
2		X	Ĺ	Ė	US 6519099 B1	Lens system and optoelectric alignment apparatus	359/819
3	X	Ė	Ľ	П	US 6475363 B1	Apparatus and method for performing microfluidic manipulations for chemical analysis and synthesis	204/451
4	X				US 6235175 B1	Microfluidic devices incorporating improved channel geometries	204/453
5	X				US 6213151 B1	Microfluidic circuit designs for performing fluidic manipulations that reduce the number of pumping sources and fluid reservoirs	137/827
6		X			US 6144791 A	Beam steering for optical fibers and other related devices	385/123
7				Ø	US 6017434 A	Apparatus and method for the generation, separation, detection, and recognition of biopolymer fragments	204/612
8	j			Ø	US 5938908 A	Capillary array electrophoresis system	204/603
9	1	X			US 5882369 A	Method for producing a capillary inside a moldable material	65/64
10	XI	1			US 5880071 A	Electropipettor and compensation means for electrophoretic bias	204/453
11	l	1		XI)	US 5833826 A	Method and apparatus for reducing the distortion of a sample zone eluting from a capillary electrophoresis capillary	204/452
12	Ď	X	1	<u> </u>	US 5796892 A	Delivery of radiation from a first transparent medium to a second transparent medium having a lower refraction index	385/38
13	Ţ	ļ	1	יַּוֹצ	US 5757014 A	Optical detection device for analytical measurement of chemical substances	250/458.1
14	İ	1	ļ	ΧĮ	US 5582705 A	Multiplexed capillary electrophoresis system	204/603
15	Ţ	Ţ	Ţ	Įι	JS 5529679 A	DNA detector and DNA detection method	204/603
16	İ	1		<b>∑</b> 1	JS 5439578 A	Multiple capillary biochemical analyzer	204/603
17	Ī		I	<b>3</b> ι	JS 5141609 A	Method and device employing time-delayed integration for detecting sample components after separation	204/452
8	İ	İ	Ì	ďι	JS 5073239 A	Fluid introduction into a capillary by electroendosmosis	204/453
9 [	Þ	4	1	Ţ	JS 5001737 A	Focusing and guiding X-rays with tapered capillaries	378/147
20	Þ	4	ļ	Ju	JS 4960316 A	Capillary splice	385/95
11	×	4	1	Ju	JS 4159863 A (	Coupling of optical glass fibres	385/33
2	X	1	İ	U	IS 20030068134 A1	Tuning the index of a waveguide structure	385/50
3	×	ļ	ļ	J	S 20030067599 A1 I	Detection cell	356/246
4	X	1	İ	Ju	S 20020162746 A1 I	Energy beam guide for an electrophoresis system	204/452
5	×	Ĺ	İ	Įυ	S 20020102091 A1 (	Glass capillary array for fluorescence analysis and manufacturing method thereof	385/146
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	1	1 2	l c	3	Document ID	Title	Current OR
26	Ì	Ĺ			Er 0/9001 A	Optical detector for liquid chromatography, capillary electrophoresis - uses analyte and reference fluid channels which are etched into cover and substrate with light path constructed as Bragg waveguide extending through analyte fluid channel	current OR
27	×	Ĺ				Flow cell with an inner layer of an amorphous fluoropolymer having a refractive index less than the refractive index of water	
28	×				DE 19010824 A	Micro-column analytic system with optical fibre for sample of fluid for liquid chromatography - has non-rigid coupling of detector-terminated fibre to outlet from capillary where light of selected wavelength interacts with flowing sample	